DETAILED ACTION

1.   This action is responsive to the communication filed 11/09/2009.

        Examiner acknowledges Applicant's submission of the Information Disclosure Statement

filed 10/22/2008.

EXAMINER'S AMENDMENT

2.   An examiner's amendment to the record appears below. Should the changes and/or

additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the

payment of the issue fee.

    Authorization for this examiner's amendment was given in a telephone interview with

    Matthew Gage (Reg. #63,059) on 01/04/2009.

        The application has been amended as follows:

Claim 1 (Currently Amended)   A method comprising:

        managing state information within a primary control unit included within a device,

wherein the state information comprises information representing a current state of one or more

consumers included within the device, wherein managing the state information comprises (i)

managing the state information within a temporally-ordered data structure, (ii) utilizing, for each

of the consumers, a commit proposal and a commit marker pair within the temporally-ordered

data structure to identify a portion of the state information for each of the consumers and (iii)

setting, for each of the consumers, the corresponding one of the commit markers to identify a

most recent object of the temporally-ordered data structure that has been communicated to and

for which an acknowledgement has been received from the respective one of the consumers;

        receiving, with the primary control unit, a change to the state information;

prior to communicating the change to the consumers of the state information included within the device, communicating to a standby control unit included within the device the change performed by the primary control unit to the state information to synchronize the state information between the primary and standby control units, wherein communicating the change to the standby control unit comprises (i) replicating the temporally-ordered data structure within the standby control unit and (ii) replicating the commit proposal and the commit marker to the standby control unit, wherein replicating the temporally-ordered data structure comprises communicating a portion of the replicated temporally-ordered data structure that is bounded by the replicated commit proposal and the replicated commit marker to the consumer from the standby control unit in the event the primary control unit fails; and

after synchronizing the state information between the primary and standby control units, communicating, with the primary control unit, the change to at least one of the consumers to update consumer state information maintained within the at least one of the consumers in accordance with the portion of state information identified by the respective one of the commit proposal and commit marker pairs of the temporally-ordered data structure, wherein at least one of the consumers comprises a forwarding component of the device;

issuing a communication from the primary control unit to cause the standby control unit to set the replicated commit proposal to identify a most recent object of the replicated temporally-ordered data structure that has not been acknowledged by the consumer; and

issuing another communication from the primary control unit to cause the standby control unit to set the replicated commit marker to identify a most recent object of the replicated temporally-ordered data structure that has been communicated to the consumer and for which an acknowledgement has been received from the consumer.

Claim 2 (Previously Presented)   The method of claim 1, wherein communicating the change to the state information to the standby control unit comprises communicating the change to the state information in accordance with an order that requires the change to be communicated to the standby control unit prior to communicating the change to the consumer of the state information.

Claim 3-6 (Cancelled)

Claim 7 (Previously presented)   The method of claim 1, further comprising setting a flag
that indicates to the consumer that the commit proposal has been set.

Claim 8 (Previously presented)   The method of claim 1, further comprising resetting the
commit marker to the object identified by the commit proposal in response to receiving the
acknowledgement.

Claim 9-11 (Cancelled)

Claim 12 (Previously Presented)   The method of claim [[11]]1, wherein issuing the other
communication to cause the standby control unit to set the replicated commit marker further
causes the standby control unit to set the replicated commit marker to the object identified by the
replicated commit proposal in response to receiving the acknowledgement.

Claim 13 (Previously presented)   The method of claim 1, wherein utilizing the commit
marker and the commit proposal further comprises deleting a least recent object of the
temporally-ordered data structure that is not bounded by the commit marker and the commit
proposal.

Claim 14 (Previously Presented)   The method of claim 1, wherein managing the state
information comprises storing the state information within a set of objects.

Claim 15 (Previously Presented)   The method of claim 14,
        wherein the change comprises one of a plurality of changes,
        wherein receiving the changes comprises receiving event messages indicating the
changes to the state information, and
        the method further comprising linking the objects of the data structure in accordance with
an order in which the event messages are received to form a temporally-ordered data structure.

Claim 16-25 (Cancelled)

Claim 26 (Currently Amended)   A device comprising:

    a primary control unit;

    a standby control unit; and

    one or more consumers, wherein at least one of the consumers comprises a forwarding component,

    wherein the primary control unit manages state information, receives a change to the state information, communicates the change to the state information to the standby control unit before communicating the changes to the consumers to synchronize the state information between the primary and standby control units, and after synchronizing the state information between the primary and standby control units, communicates the change to at least one of the consumers to update consumer state information maintained within the at least one of the consumers with the change, and

    wherein the state information comprises information representing a current state of the consumer included within the device,

    wherein the primary control unit further (i) manages the state information within a temporally-ordered data structure, (ii) utilizes, for each of the consumers, a commit proposal and a commit marker pair within the temporally-ordered data structure to identify a portion of the state information for each of the consumers and (iii) setting, for each of the consumers, the corresponding one of the commit markers to identify a most recent object of the temporally-ordered data structure that has been communicated to and for which an acknowledgement has been received from the respective one of the consumers,

wherein the primary control unit also (i) replicates the temporally-ordered data structure within the standby control unit and (ii) replicates the commit proposal and the commit marker to the standby control unit,

wherein the primary control unit replicates the commit proposal and the commit marker to the standby control unit and communicates a portion of the replicated temporally-ordered data structure that is bounded by the commit proposal and the commit marker to the consumer from the standby control unit in the event the primary control unit fails, ~~and~~

wherein the primary control unit further, after synchronizing the state information between the primary and standby control units, communicates the change to the at least one of the consumers to update the consumer state information maintained within the at least one of the consumers in accordance with the portion of state information identified by the respective one of the commit proposal and commit marker pairs of the temporally-ordered data structure,

wherein the primary control unit issues a communication that causes the standby control unit to set the replicated commit proposal to identify a most recent object of the temporally-ordered replicated data structure that has not been acknowledged by the consumer, and

wherein the primary control unit issues a another communication that causes the standby control unit to set the replicated commit marker to identify a most recent object of the temporally-ordered replicated data structure that has been communicated to the consumer and for which an acknowledgement has been received from the consumer.

Claim 27 (Previously Presented)   The device of claim 26, wherein communicating the change to the state information to the standby control unit comprises communicating the change to the state information in accordance with an order that requires the change to be communicated to the standby control unit prior to communicating the change to the consumer.

Claim 28-30 (Cancelled)

Claim 31 (Previously presented)   The device of claim 26, wherein the commit proposal and the commit marker identify the portion of the state information within the data structure that has been communicated to the consumer.

Claim 32 (Previously presented)   The device of claim 26, wherein the primary control unit
sets the commit proposal to identify a most recent object of the temporally-ordered data structure
that has been communicated to the consumer, and sets the commit marker to identify a most
recent object of the temporally-ordered data structure that has been communicated to the
consumer and for which an acknowledgement has been received from the consumer.

Claim 33 (Previously Presented)   The device of claim 32, wherein the primary control unit
sets a flag that indicates to the consumer that the commit proposal has been set.

Claim 34 (Previously Presented)   The device of claim 32, wherein the primary control unit
further sets the commit marker to the object identified by the commit proposal in response to
receiving the acknowledgement.

Claim 35-37 (Cancelled)

Claim 38 (Currently Amended)   The device of claim [[37]] 26, wherein the other
communication that causes the standby control unit to set the replicated commit marker further
causes the standby control unit to set the replicated commit marker to the object identified by the
replicated commit proposal in response to receiving the acknowledgement.

Claim 39 (Previously presented)   The device of claim 26, wherein the primary control unit
utilizes the commit marker and the commit proposal to delete a least recent object of the
temporally ordered data structure that does not include the commit marker and the commit
proposal.

Claim 40 (Previously presented)   The device of claim 26,

    wherein the change comprises one change of a plurality of changes,

    wherein the primary control unit receives event messages indicating the changes to the state information, and links objects of the data structure in accordance with an order in which the event messages are received to form the temporally-ordered data structure.

Claim 41 (Previously Presented)   The device of claim 26, wherein the primary control unit manages state information by storing the state information within a set of objects.

Claim 42-50 (Cancelled)

Claim 51 (Currently Amended)   A computer-readable medium comprising instructions for causing a primary control unit to:

manage state information stored within the primary control unit included within a device, wherein the state information comprises information representing a current state of one or more consumers included within the device, wherein managing the state information comprises (i) managing the state information within a temporally-ordered data structure, (ii) utilizing, for each of the consumers, a commit proposal and a commit marker pair to identify a portion of the state information for each of the consumers and (iii) setting, for each of the consumers, the corresponding one of the commit markers to identify a most recent object of the temporally-ordered data structure that has been communicated to and for which an acknowledgement has been received from the respective one of the consumers;

receive a change to the state information;

communicate the change to the state information in accordance with an order that requires the changes to be communicated to the standby control unit before communicating the changes to the consumers of the state information included within the device such that the state information is synchronized between the primary and standby control units, wherein communicating the change to the standby control unit comprises (i) replicating the temporally-ordered data structure within the standby control unit and (ii) replicating the commit proposal and the commit marker to the standby control unit, wherein replicating the temporally-ordered data structure comprises communicating a portion of the replicated temporally-ordered data structure that is bounded by the replicated commit proposal and the replicated commit marker to the consumer from the standby control unit in the event the primary control unit fails; and

after synchronizing the state information between the primary and standby control units, communicate the change to at least one of the consumers to update consumer state information maintained within the at least one of the consumers in accordance with the portion of state information identified by the respective one of the commit proposal and commit marker pairs of the temporally-ordered data structure, wherein at least one of the consumers comprises a forwarding component;

issuing a communication from the primary control unit to cause the standby control unit to set the replicated commit proposal to identify a most recent object of the replicated temporally-ordered data structure that has not been acknowledged by the consumer; and

issuing another communication from the primary control unit to cause the standby control
unit to set the replicated commit marker to identify a most recent object of the replicated
temporally-ordered data structure that has been communicated to the consumer and for which an
acknowledgement has been received from the consumer.

Claim 52-53 (Cancelled)

Claim 54 (Previously presented)   The computer-readable medium of claim 51, wherein the
instructions cause the primary control unit to:

        set the commit proposal to identify a most recent object of the temporally-ordered data
structure that has been communicated to the consumer; and

        set the commit marker to identify a most recent object of the temporally-ordered data
structure that has been communicated to the consumer and for which an acknowledgment has
been received from the consumer.

Claim 55 (Cancelled)

Claim 56 (Previously presented):   The method of claim 1, wherein the device comprises a
router.

Claim 57 (Cancelled)

Claim 58 (Previously presented):   The device of claim 26, wherein the device comprises a
router.

Claim 59 (Cancelled)

Reasons For Allowance

3.   Claims 1,2, 7, 8, 12-15, 26, 27, 31-34, 38-41, 51, and 54 hereafter referred to as 1-22 are

allowed.

4.   The following is an examiner's statement of reasons for allowance:

        The Examiner has found that the prior art of record does not teach nor suggest or render

obvious the claimed limitations in combination with the specific added limitations recited in

independent claims and subsequent dependent claims.

        One such prior art of record is U.S. Patent No. 6,910,148), to Ho teaches "A router and

routing protocol redundancy are disclosed to reduce service outage or degradation for a network

device and thus to increase service availability on a network due to software and hardware

failures of the network device...By replicating the routing protocol state change, the standby

controller system can maintain the routing protocol sessions for the network device if a failure

occurs in the active controller system".

        The prior art of record provides no rationale for the limitation of at least "receiving, with

the primary control unit, a change to the state information;

prior to communicating the change to the consumers of the state information included within the device, communicating to a standby control unit included within the device the change performed by the primary control unit to the state information to synchronize the state information between the primary and standby control units, wherein communicating the change to the standby control unit comprises (i) replicating the temporally-ordered data structure within the standby control unit and (ii) replicating the commit proposal and the commit marker to the standby control unit, wherein replicating the temporally-ordered data structure comprises communicating a portion of the replicated temporally-ordered data structure that is bounded by the replicated commit proposal and the replicated commit marker to the consumer from the standby control unit in the event the primary control unit fails;

after synchronizing the state information between the primary and standby control units, communicating, with the primary control unit, the change to at least one of the consumers to update. consumer state information maintained within the at least one of the consumers in accordance with the portion of state information identified by the respective one of the commit proposal and commit marker pairs of the temporally-ordered data structure, wherein at least one of the consumers comprises a forwarding component of the device;

issuing a communication from the primary control unit to cause the standby control unit to set the replicated commit proposal to identify a most recent object of the replicated temporally-ordered data structure that has not been acknowledged by the consumer; and

issuing another communication from the primary control unit to cause the standby control unit to set the replicated commit marker to identify a most recent object of the replicated temporally-ordered data structure that has been communicated to the consumer and for which an

acknowledgement has been received from the consumer.", as in claim 1. Thus this claim has

been found to be allowable over the prior art of record.

Examiner notes that claim 51 is drawn towards a "computer-readable medium" wherein

the instant specification defines *computer-readable medium* as "computer- readable medium may

comprise random access memory (RAM), read-only memory (ROM), non-volatile random

access memory (NVRAM), electrically erasable programmable read- only memory (EEPROM),

flash memory, magnetic or optical media, or the like. (paragraph [0074]), " However use of the

language "or the like.," has not been interpreted by Examiner as an intended non-statutory

medium to be claimed, but rather Examiner has considered, paragraph [0074] of Applicant's

instant specification to mean only a computer readable storage medium.

Any comments considered necessary by applicant must be submitted no later than the

payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for

Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Joiya Cloud whose telephone number is 571-270-1146. The

examiner can normally be reached Monday to Friday from on 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

William Vaughn can be reached on 571-272-3922. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-3922.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information

for unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access

to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free).

JMC

January 11, 2010

/Yemane Mesfin/
Primary Examiner, Art Unit 2444